FIG. 1

F_{in}

½ Fin   ½ Fin

FIG. 2

Fin

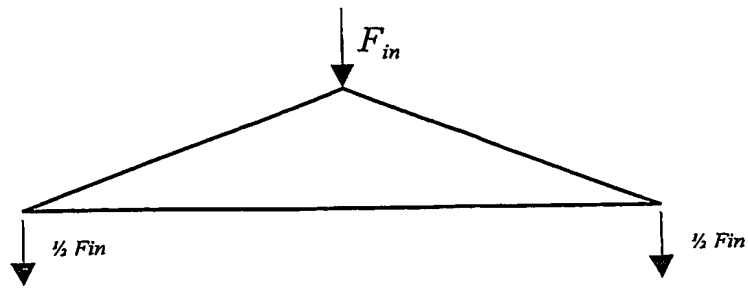½ Fin   ½ Fin
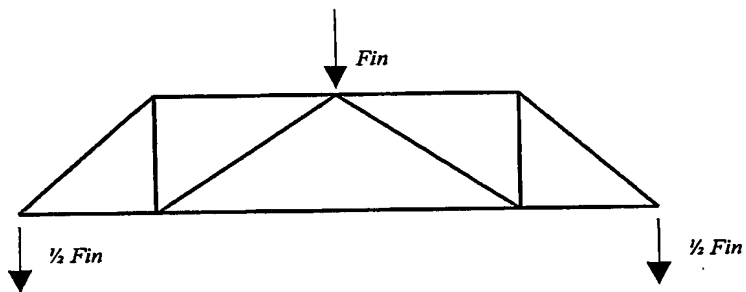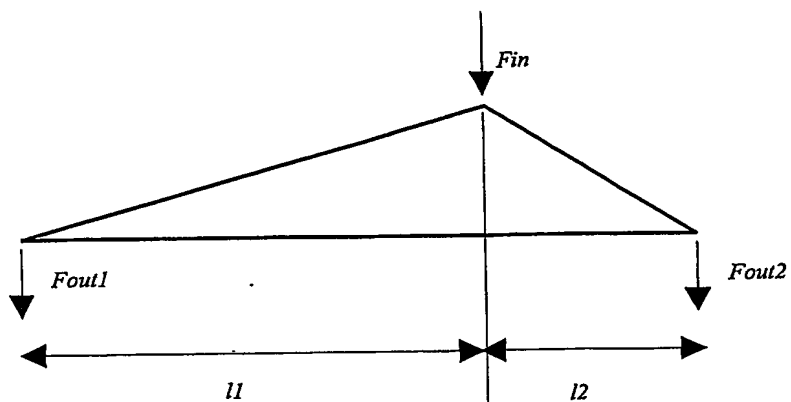
FIG. 3

$$F_{out\ 1} = \frac{l_2}{l_1 + l_2} F_{in}$$

$$F_{out\ 2} = \frac{l_1}{l_1 + l_2} F_{in}$$

FIG. 4

FIG. 5

F_{in}

502

Fin

½ Fin

½ Fin

504
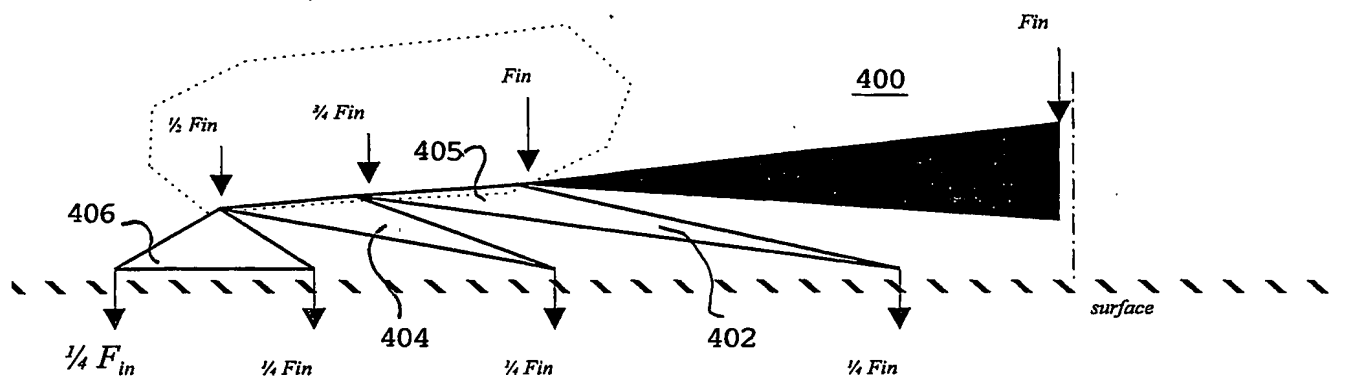
506

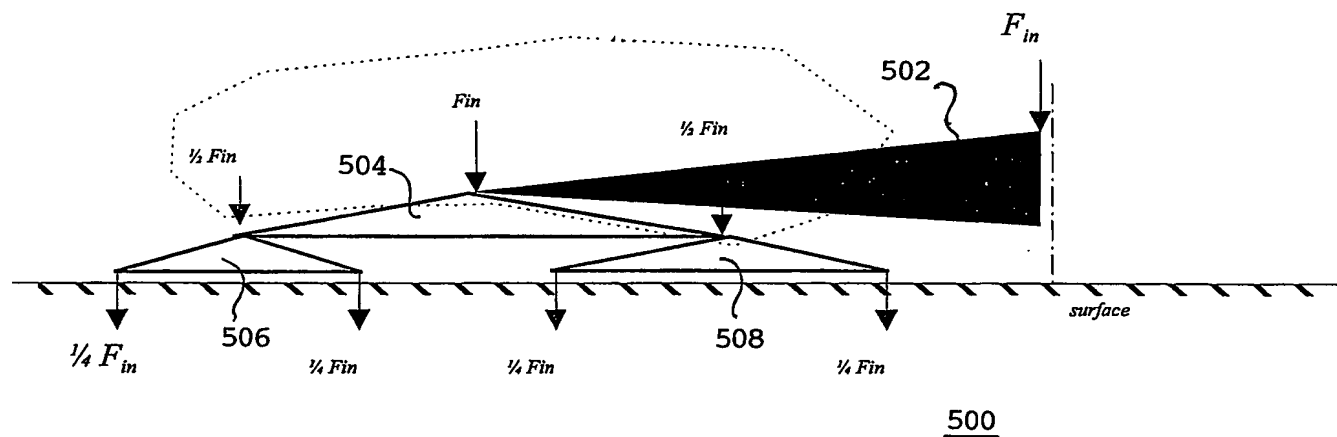508

¼ F_{in}
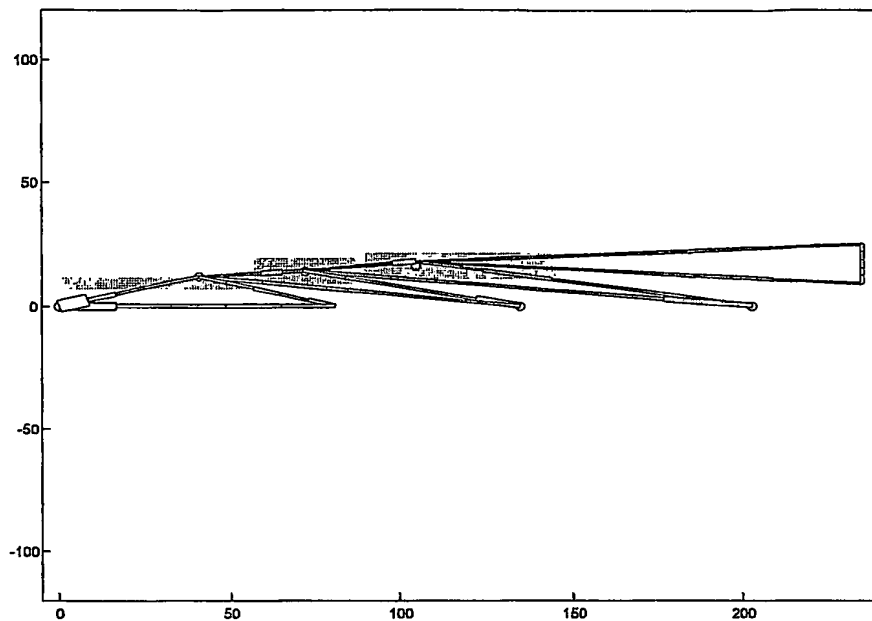
¼ Fin

¼ Fin

¼ Fin

surface

500

FIG. 6

Optimized wiper design
(Equality of output forces were optimized over a range of surface curvatures)

FIG. 7

Deformed Geometry for Wiper Design
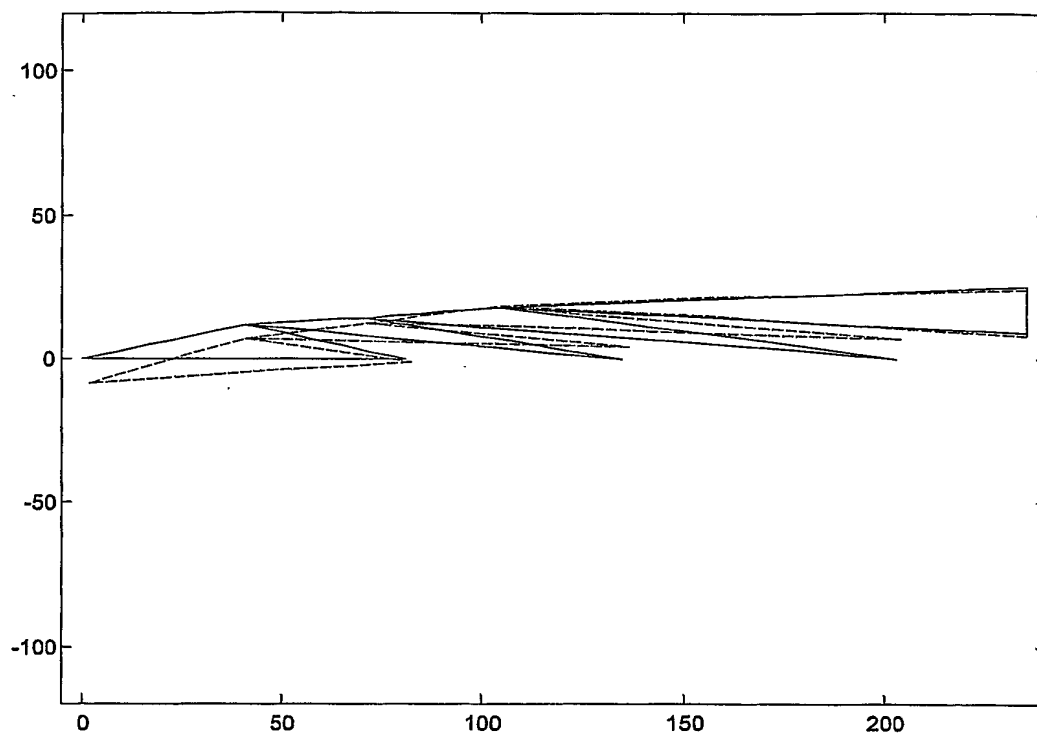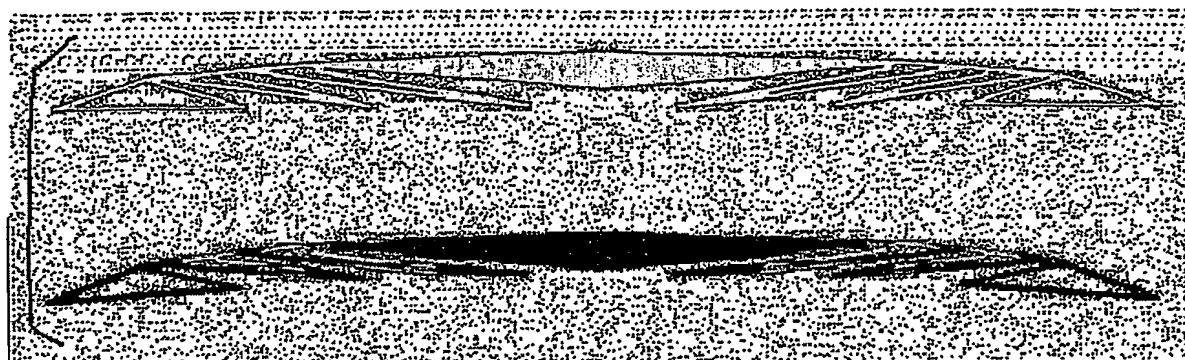(Curved Boundary Condition)

FIG. 8

Nonlinear finite element analysis showing the initial shape of the wiper blade (top image). The lower image shows the stress distribution in the wiper as it conforms to a curved boundary (windshield). Near equal force distribution is obtained for flat to highly curved boundaries.